DOCUMENT RESUME

ED 452 276 TM 032 564

AUTHOR Jiang, Mingming; Shrader, Vincent
TITLE Building a Revolutionary Way of Learning: A Study of a Competency-Based Online Environment.
PUB DATE 2001-04-14
NOTE 24p.; Paper presented at the Annual Meeting of the American Educational Research Association (Seattle, WA, April 10-14, 2001).
PUB TYPE Reports - Research (143) -- Speeches/Meeting Papers (150)
EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Computer Assisted Instruction; Educational Technology; *Electronic Mail; *Graduate Students; Graduate Study; Higher Education; Mentors; *Online Systems; *Student Attitudes

ABSTRACT

This study investigated factors that might be related to successful academic progress and students' satisfaction with a competency-based graduate program in an online environment. It offers an in-depth look into the structure and operations of a Master of Arts Program in Learning and Technology at Western Governor's University, Utah. At the time of the study, the number of students actively engaged in e-mail correspondence with their mentors and in working on the degree was 80. All were teachers at various levels, managers of training, and technology facilitators; all held bachelor's degrees. Results of the e-mail survey indicate that the students' overall satisfaction is high. Students were most satisfied with the flexibility of time and place provided by an online degree program and the academic services provided by the mentor. The area in which students felt the need for examination and improvement was demonstrating competencies through domain assessments. Among the variables selected for the study, only "contacts with a mentor" had a significant relationship with students' satisfaction. "Student-mentor interaction" was a strong predictor for students' academic progress. Courses and hours for studies were significantly correlated with academic progress but not powerful enough to predict the variance of the academic progress. Pre-assessment did not have any significant correlation with academic progress. The survey questions are appended. (Contains 3 tables and 17 references.) (SLD)

Reproductions supplied by EDRS are the best that can be made
from the original document.

Symposium (AERA 2001) Division C4b: Learning Environments
Place: Convention Center 4th Floor Room 613
Time: 4/14/01 10:35:00 AM Ends: 12:05:00 PM

Building a revolutionary way of learning: A study of a competency-based online environment

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
✓ This document has been reproduced as received from the person or organization originating it.
☐ Minor changes have been made to improve reproduction quality.
• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

Mingming Jiang
Western Governors University
mjiang@wgu.edu

Vincent Shrader
Western Governors University
vshrader@wgu.edu

PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL HAS BEEN GRANTED BY

M. Jiang

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

Abstract: This paper examines factors that might be related to successful academic progress and students' satisfaction with a competency-based graduate program in an online environment. It offers an in-depth look into the structure and operations of a Master of Arts Program in Learning and Technology in Western Governors University. We are interested in finding out 1) if student's academic progress is related to pre-assessment and interaction with mentor; 2) if students' satisfaction with the program is related to pre-assessment, academic progress, and interaction with mentor; 3) if number of courses taken is related to students' academic progress and their satisfaction with the program; 4) if students' demographic profile has any relations with their satisfaction with the program and their academic progress. The findings will help identify factors that might contribute to students' success in a competency-based online program.

ED 452 276

Background

The need for a competency-based program

In dynamic global, national, and state economies with tightening resources and changing demographics (Western Interstate Commission for Higher Education, 1999), there is a need to provide potential workers with an increasingly complex set of basic skills in order to guarantee a well-qualified future workforce (Demetrion, 1999). In such an environment, there is a growing need for flexible, tailor-made educational programs that address individual needs and to integrate learning and working environment (Westera & Sloep, 1998). Therefore, the "classical ideals of erudition and scholarship, with a major emphasis on knowledge of facts, had better be replaced by an educational system that supports the acquisition of skills or competencies." (Westera & Sloep,1998, p. 32). Hence, there is the need for a competency-based education.

TM032564

Distance online learning

There is a growing interest in distance education as an educational concept and delivery method (Westera & Sloep, 1998). Research "indicates that teaching and studying at a distance can be as effective as traditional instruction, when the method and technologies used are appropriate to the instructional tasks, when there is student-to-student interaction, and when there is timely teacher-to-student feedback (Moore & Thompson, 1990; Verduin & Clark, 1991. Quoted from Willis, 1993). The advancement of telecommunications is providing distance learning with such appropriate "method and technologies" (Jiang & Ting, 2001). Online learning is building a bridge between distance learning and traditional classroom education by combining the advantages of both into an environment that the student can learn independent of time and place, and yet receive student-student interaction and immediate feedback from the instructor (Harasim, 1990). Online learning supports current educational theories such as constructivism, social collaborative learning, cognitive apprenticeship, and situated learning (Jiang, 1998; Jiang & Meskill, 2000). The emphasis on transmission of knowledge has been

BEST COPY AVAILABLE

challenged by constructivist views that "focus on competencies, and allow students to decide upon their learning objectives and learning activities themselves (Duffy & Jonassen, 1991)" (Westera & Sloep, 1998, P. 32).

Distance learning and online learning are being blended into one unprecedented new paradigm that offers a convenient and interactive learning environment to learners. In this environment, mentoring plays an important role. Picciano compares the distance learning environment to a microworld that "the learner learns by interacting with the available resources—teacher, tutor, information, media, etc.—and drawing on his own experiences to construct the knowledge to solve problem. In this scenario, the ability to interact with teachers or tutors as well as to access other materials becomes very important. Designers must ensure that the ability to do both is available in the distance learning environment." (Picciano, 2001) A signature feature of WGU programs is students are assigned a qualified mentor -- an expert in their field of study who will help them create a plan and calendar for completing their degree program and will work with them until they graduate.

Based on the above discussion, it seems that a marriage between the competency-based education and distance online learning should offer great opportunities and flexibilities for learners who are on the job, live in remote areas without easy access to a university, have ample experiences and do not want to go through the traditional process of credit accumulation, or have family duties and cannot afford to sit in traditional classes for a degree. However, this is an entirely new area and there is literally no empirical research on this online competency-based model of education. As is true with any new models of education, it is important to examine the model to identify factors that might affect students' performance in the program. Therefore, the significance of the paper lies in that it will provide some preliminary insights into this brand new realm: a learning environment marrying competency-based education with distance online education.

Western Governors University

The need for a competency-based education, the growing interest in distance education, and the fast growing online educational opportunities are the yeast for the establishment of a unique university - the Western Governors University - with a mission to improve quality of education and expand access to postsecondary educational opportunities. Each of its programs (both degree and certificate) has a specific set of competencies developed by the program's respective Program Council faculty, who determine the knowledge and abilities that students completing the program need to possess. The students are not required to accumulate a required number of credits, as is the case in traditional institutions; they are required to demonstrate mastery in the defined competencies to receive a WGU degree or certificate. The University's Assessment Council faculty, in cooperation with the Program Councils, defines the assessment batteries by which these competencies are to be measured. Figure 1. Illustrates this difference between the WGU competency-based model and the traditional credit-based model.

--- Insert Figure 1: WGU Competency-Based Model --

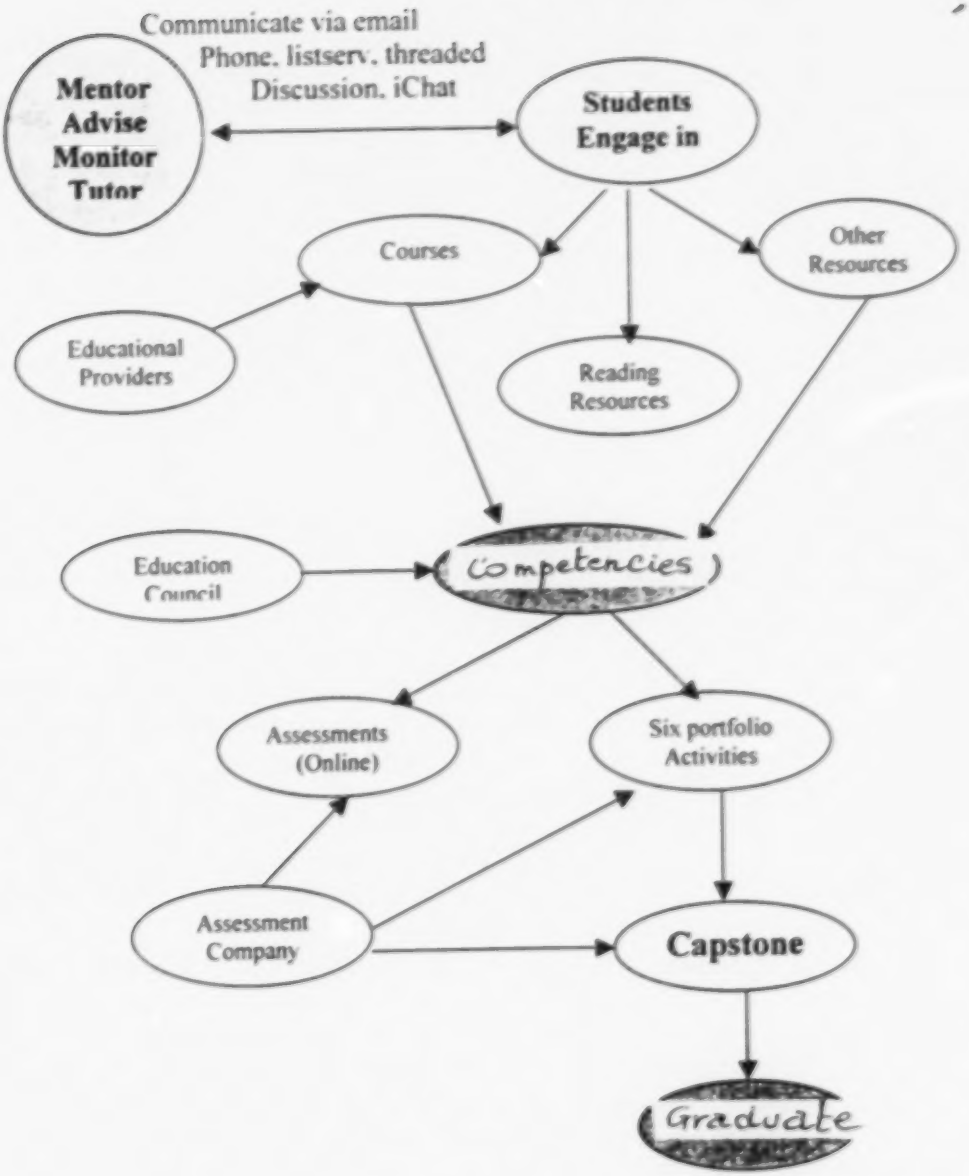
The Master of Arts of Learning and Technology program, the focus of this study, started in the fall of 1999 and has now over 120 students in the program. There are six subject areas (domains) that students in the program are required to demonstrate their competencies through six objective assessments and six essay assessments, six portfolio activities, and a final capstone portfolio project to finish the program, as is shown in Figure 2.

--- Insert Figure 2. WGU Master of Arts in Learning and Technology --

Before a student is admitted into the program, s/he completes a pre-assessment, a skill survey, and an Intake Interview. Upon admission, s/he is assigned to a mentor who will then analyze the student's files and conduct phone interviews with the student to discuss and create a detailed academic action plan based on the student's entry level, her/his educational goal and time frame.

Western Governors University implements a model that separates assessment from instruction, which means that its faculty, the mentors, does not directly deliver instruction. Students take courses that are offered by Educational Providers. The responsibilities of the WGU mentors are to provide academic guidance, advising, and tutoring to WGU students throughout their programs. The mentoring activities range from designing a preferred path, preparing students for assessments, review of portfolio before submission. The mentoring is conducted via email, listserv, and threaded discussion and telephone. The main channel for students to communicate with their mentor is email. Figure 3 illustrates this mentoring process.

Figure 3. The process of earning the MLT degree



BEST COPY AVAILABLE

A critical role of the mentor is to work with a student to lay out a preferred path for the student to pursue his interested area. During those initial phone interviews, the mentor guides the student into thinking and formulating a theme at an early stage for his future capstone so that s/he can design the portfolios in a way they will build up the capstone. The mentoring process reflects a cognitive apprenticeship and situated learning model in that the mentor gradually guides the student in exploring problems or needs that exist in his work environment, the real life situation, and that s/he will find best solutions to those problems or needs through his learning in WGU. In many cases, this exploration resulted in the involvement of a student's employer in identifying existing problems or needs and their support for the student to solve the problems by completing this master degree. When this happens, earning a WGU degree has become a process of applying what a student is learning in the program to the solution of real life problems. This relevance of skills to workplace will create high motivation to learn and satisfaction of the program, according to Keller's ARCS model (see Dick & Carey, 1992).

Research design

The purpose of the study is to identify factors that are related to students' academic progress in the program for further inquires. The selection of variables and the design of the survey questions were based on our understanding of research literature on distance online learning as discussed above and the unique structure of the WGU online competency-based model. Since a student's academic action plan is individualized partly based on students' entry level, we assume that students will be progressing at different speed, but their academic progress and their satisfaction should not be influenced by their pre-assessment. If there was a relationship, either negative or positive, this would inform us of the necessity of emphasizing basic skills learning for students with low pre-assessment results or more advanced learning opportunities for students with higher pre-assessment results.

Our learning resources for students to reach the required level of competencies range from online credit-based courses, Web-based learning materials, and self-directed reading. The choice of these options is based on students' pre-assessment results, students' individual learning styles, their financial situation, and the availability of the courses. Because students vary so much in the number of courses taken, we are very interested in finding out if the number of courses taken has any positive relation with their academic progress. We believe that although courses help students learn a domain in a more systematic way; they are taken based on needs and therefore should not have influence on academic progress.

As is discussed above, the mentor plays an important role in the process of students' completing the program. There are many aspects that are worthy of examination, such as the pattern of email correspondence and phone calls. Owing to the limited space and the preliminary stage of the inquiry, we will only do a count of emails a student sent to their mentor as frequency of student-mentor interaction. We want to know if the amount of emails students sent to their mentor has any relation with their academic progress and their satisfaction with the program. We assume that the more the students communicate with their mentor, the more motivated the students are and the more academic help they obtain from their mentor, therefore they progress faster and are more satisfied with the program.

In addition, since this study was exploratory, we included several commonly used independent variables such as age, gender, current position, years in education, and hours students spent on studies as reported by students themselves. We wanted to see if they had any significant relations with students' satisfaction with the program and their academic progress.

Based on the above assumptions, we formulated the following research questions:

1. How satisfied are students with the competency-based online program?

2. Is the amount of student-mentor interaction related to students' satisfaction with the program and academic progress?
3. Is there any correlation between students' academic progress and courses taken?
4. Does pre-assessment relate to students' satisfaction with the program and academic progress?
5. Does academic progress relate to students' satisfaction with the program?
6. Do students' demographic profiles have any relationship with satisfaction and academic progress?

Operational definition of variables:

1. **Academic progress:** The sum of domain assessments divided by months in program. The domain assessments include objective tests, essay tests and portfolio activities a student has passed.
2. **Courses**: Raw count of courses that a student has taken or is taking.
3. **Pre-assessment**: Scores of pre-assessment that a student takes upon admission to the program.
4. **Students' satisfaction**: Summary of students' responses to 13 survey questions seeking students' degree of satisfaction with various aspects of the competency-based program including their satisfaction with the online learning, different types of learning opportunities, different media for class discussion, mentoring and the competency-based mode of learning.
5. **Student-mentor interaction:** A raw count of emails a student sent to her/his mentor divided by the number of months a student has been in the program to obtain the frequency of email interaction with the mentor.
6. **Contacts with mentor per week**: Students' report of weekly contacts with mentor. This is the perceived student-mentor interaction.
7. **Current position**: Students report of current position. We identified them either as teachers or non-teachers represented by 1 and 2 respectively. Our program was initially designed as an umbrella program attracting both schoolteachers and non-schoolteachers. This variable is to see if there are any differences between these two groups regarding program satisfaction and academic progress.
8. **Years in Education**: Students' report of number of years in education
9. **Hours for studies**: Students' report of time spent on learning each week (See Table 1)

--- Insert Table 1. Variables for the Correlation and Multiple regression analyses –

Participants

Students enrolled in the Master of Arts in Learning and Technology program in WGU (N = 120). At the time of the survey, the number of students who were actively engaged in email correspondence with their mentors and in working on the degree was 80. They are mostly from Utah, Washington, and Wyoming. They all hold a bachelor's degree. They are elementary, middle school, high school teachers, technology coordinators, managers of training, and technology facilitators. Students who were new to the program at the time of the administration of the survey were not included in the study.

Data for the study

The researchers are mentors of the students in the program and used the following sources of data:

1. Results of pre-assessment
2. Results of domain assessments: essays, portfolios.
3. Number of courses taken/taking
4. Raw count of student emails to their mentors
5. Survey responses: The researchers developed a survey which was eventually revised and expanded by a group consisting of the researchers, Director of Institutional Research, Senior Academic Officer, and Director of Academic Services. The survey was then used for a dual purpose: to officially evaluate the program and for this research. The survey was sent out on January 31 and the last three responses trickled in by mid-March. A following-up email was sent out one week after the first call for responses. Our Senior Academic Officer and Director of Institutional Research managed the whole process from administration and data management. For confidentiality reasons, the researchers did not receive the responses. The survey data were entered into an SPSS file and then merged with information from students' records by the Director of Institutional Research. Altogether 34 responses were received with a response rate of 43%. The response rate was based on 80 active students who checked emails regularly and are actively engaged in learning. One response contains incomplete information and was thus not included in the analysis. The study used 13 satisfaction questions and some other demographic information from the survey (See Appendix 1).

Data analysis

Survey results are summarized to present an overall picture of students' satisfaction of the program (See Appendix 2). Students' overall satisfaction is high with a mean composite score of 3.18 on a 1-4 rating scale. Except three questions, all received a mean above 3 points. Table 2 below indicates that the students feel most satisfied with flexibility of time provided by an on-line degree program (M=3.73, Question4), flexibility of place provided by an on-line degree program (M=3.61, Question5), and the academic services provided by the mentor (M=3.45, Question10). The relatively weak area is students' satisfaction with demonstrating competencies through domain assessments (M=2.52, Question11).

Table 2: Means and Standard Deviations for the survey results (N = 33)

	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Satisfaction Mean
Mean	2.97	3.15	2.97	3.73	3.61	3.03	3.27	3.31	3.15	3.45	2.52	3.21	3.09	3.18
SD	.64	.87	.97	.52	.67	.77	.76	.69	.76	.71	.94	.84	.80	.517

Correlation analysis and multiple regression analysis

Correlation was run to see 1) if student's academic progress is related to pre-assessment and interaction with mentor; 2) if students' satisfaction with the program is related to pre-assessment, academic progress, and interaction with mentor; 3) if number of courses taken is related to students' academic progress and their satisfaction with the program; 4) if students' demographic profiles have any relationship with their satisfaction with the program and their academic progress.

Data were arranged in a table that includes data of students' satisfaction, demographic information, and academic information obtained from students' records. Scatter plots were

conducted to identify outliers among the variables. One case was found to be an outlier for the independent variable *student-mentor interaction* and so we deleted that case from the sample to obtain a normal distribution of sample required for our multiple regression analysis. Thus the final sample size for the analyses was N = 32 (see Appendix 3).

Results

Results for the correlation analysis are summarized in Table 3. Interrelations among students' satisfaction, academic progress, and other variables. Our study is most interested in knowing what factors are related to students' satisfaction and their academic progress.

--Insert Table 3. Interrelations among students' satisfaction, academic progress, and other variables (N = 32) –

Predictors for students' satisfaction

Results show that one variable, *contacts with mentor every week*, is significantly and positively related with students' satisfaction with the program ($r = .40$, $p < .05$). In order to find out if this variable and any other variables could together predict the variance of the dependent variable, *satisfaction with program*, we conducted multiple regression analysis using students' satisfaction as the dependent variable. Stepwise was used for the selection of predictors.

Table 4. Variables for Multiple Stepwise Regression Analysis to predict students' satisfaction with program

Dependent variable	Independent variables									
Satisfaction	Academic progress	Age	Gender	Contacts with mentor	Courses	Current Position	Hours for studies	Years in Education	Pre-test	Student-Mentor Interaction

Results are summarized in Tables 5 and 6.

Table 5. Summary of Multiple Stepwise Regression analysis for variables predicting students' satisfaction (N = 32)

Variables Entered			
Variable	B	SE B	Beta
Contacts with mentor	.136	.057	.396*
(Constant)	2.776	.197	
Variables Removed			
Variable	Beta In	Partial	Min Toler
Academic progress	.100	.100	.844
Age	.071	.077	.996
Courses taken	.007	.007	.879
Current position	.100	.104	.923
Gender	-.262	-.285	.997
Hours per week	-.070	-.077	.999
Pre-test results	.258	.281	.996
Student-mentor interaction	.136	.134	.817
Years in Education	-.288	-.313	.997

Note. R^2 = .129 (p < .05)
* p < .05

Table 6. Summary of Analysis of Variance

	df	SS	MS	F
Regression	1	1.306	1.306	5.593*
Residual	30	7.004	.233	

* p < .05

From Table 5 we see that Stepwise selection entered the variable, *contacts with mentor*, in the model as the predictor for students' satisfaction (F = 5.593, p <. 05). Although we have a significant F value of 5.593 at the .05 level (see Table 5), the R Square is only .13 that means that only about 13% of the variance of students' satisfaction can be explained by *contacts with mentor*.

Predictors for students' academic progress

Correlation analysis indicates that four variables are significantly correlated with academic progress: hours for studies (r = .40, p < .05), contacts with mentor (r = .39, p < .05), student-mentor interaction (r = .78, p < .01), courses (r = .50, p < .01). A second multiple stepwise regression analysis was conducted using academic progress as the dependent variable. Variables included in this analysis were age, gender, type of career, years in education, hours for studies, courses, contact with mentor, student-mentor interaction and pre-test (see Table 7).

Table 7. Variables for Multiple Stepwise Regression Analysis to predict academic progress

Dependent variable	Independent variables								
Academic progress	Age	Gender	Contacts with mentor	Courses	Current Position	Hours for studies	Years in Education	Pre-test	Student-Mentor Interaction

Results are summarized in Tables 7 and 8.

Table 8. Summary of Multiple Stepwise Regression analysis for variables predicting students' academic progress (N = 32)

Variables Entered				
Variable	B	SE B	Beta	t
(Constant)	.559	.158		3.534
Interact	.111	.013	.853***	8.730
Age	-1.42	.004	-.352***	-3.604

Variables Removed			
Variable	Beta In	Partial	Min Toler
Courses taken	.109	.184	.759
Contact with mentor	.062	.108	.788
Current position	-.118	-.225	.941
Gender	-.008	-.015	.881
Hours per week	.111	.201	.850
Pre-test results	.063	.120	.911
Years in Education	.061	.091	.587

Note. R^2 = .602 for Step 1; R^2 = .715 for Step 2 (ps < .05)
*** p < .0001

Table 9. Summary of Analysis of Variance

	df	SS	MS	F
Regression	2	2.317	1.158	39.575 ***
Residual	29	.840	2.898	

* ** p < .0001

The Stepwise method entered two variables, student-mentor interaction and age as the predictors for academic progress with an F value at 39.98 (p < .0001). An R Square of .715 means that nearly 72% of the variability of the dependent variable *academic progress* could be explained by the variability in student-mentor interaction and age. The R Square for step 1 is .602. When step 2 added the second variable, Age, as a predictor, it only added .113 to the R Square; therefore, the variable student-mentor interaction is a much stronger predictor. This finding corresponds to the results from the correlation analysis that produced a correlation coefficient of .78 (p < .01) for the relation between student-mentor interaction and academic progress. It is interesting to note that our correlation analysis did not show any significant relation between age and academic progress while the Stepwise method entered age as the

second predictor. The negative coefficient (-.352) for age means that the variable has a negative influence on academic progress. that is. older students might progress slower.

Conclusion and Discussion

Students' overall satisfaction

Students' overall satisfaction is high with a mean score of 3.18 on a 1- 4 rating scale. Students felt most satisfied with flexibility of time and place provided by an on-line degree program. and the academic services provided by the mentor. The area that calls for examination and improvement is demonstrating competencies through domain assessments. The domain assessments and portfolio activities all require extensive work. In many situations. students can easily sit through a graduate course but have problems passing a domain test. Conceptually an assessment is more of a challenge than an easy course; therefore quite a few students need some psychological preparation to meet the challenge. Once they get through the first hurdle. it is easier for them to go through more hurdles. Our program was the first competency-based online program to implement a set of assessments developed by a third-party. There has been room for improvement in the test items. assessment deliveries and scheduling. and reporting of assessment results. Efforts have been made to improve the assessments. The scope of knowledge skills is so comprehensive that there is no single course or book that can cover an entire domain and so it took the mentors nearly a year to map complete learning resources for all these domains. Now that students have better learning resources for the preparation of the assessments and their passing rate is increasing. their satisfaction with the assessment might also improve.

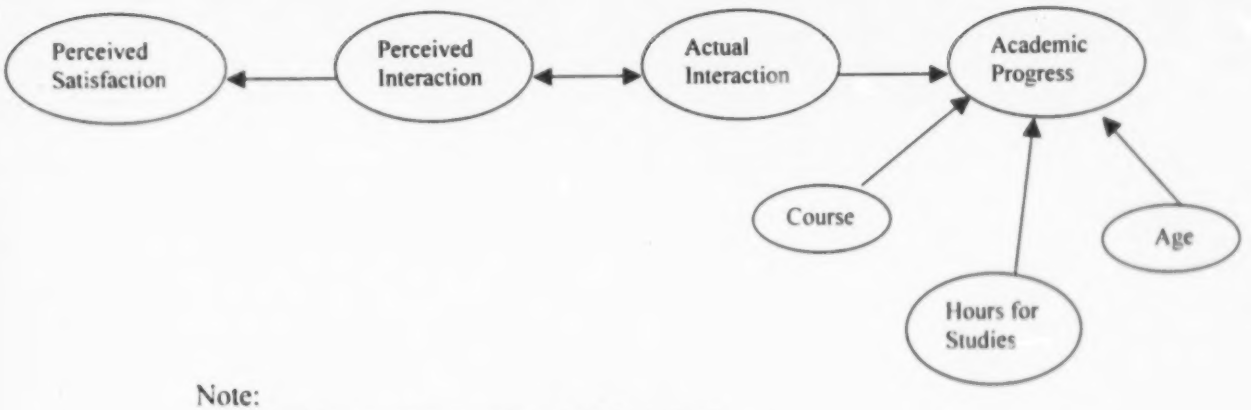
Factors relating to students' satisfaction

Among all the variables we selected for the study. only *contacts with mentor* has a significant relation with students' satisfaction. The multiple stepwise regression analysis selected *contacts with mentor* as a predictor for satisfaction. Although a relatively small R Square of .13. it tells us that students were more satisfied when they felt they had more contacts with their mentor. This echoes students' high satisfaction with the academic services provided by mentor and reiterates the importance of interaction with mentor. To our surprise. although there was a significant correlation between *contacts with mentor* and *student-mentor interaction*. the latter did not have a significant relation with students' satisfaction. We do not know why this happened and will further investigate these variables. One possible reason for this might be the self-selected sampling via survey. The various demographic variables did not bear any significant relationship with satisfaction. which indicates that the program is appropriate for students of all types. In line with our expectations. *pre-assessment* did not bear any significant relation with satisfaction either. thus supporting our assumption that students at different skill levels (when certain admission requirements are met) should be equally satisfied with the program .

Factors relating to students academic progress

In contrast. the multiple stepwise regression analysis selected *student-mentor interaction* as a strong predictor for students' academic progress.

Figure 4. Interrelations among correlated variables



Note:
Perceived interaction = contacts with mentor
Actual interaction = student-mentor interaction

Figure 4 shows a linear relation among four important variables: *contacts with mentor*, the perceived interaction between student and mentor, is significantly correlated with *student-mentor interaction*, and these two seem to have some influence on *perceived satisfaction* and *academic progress* at the ends of the linear line. This finding is meaningful and is in line with existing research on mentoring. An important aspect of planning is establishing the interactive and communications components of the distance learning environment. In addition, students need advisors and counselors with whom to share and discuss issues and concerns that might affect their academic performance (Picciano, 2001, p.95). The opportunity of regular contacts with the instructor increased students' chances of success (Dille & Mezack, 1991). And this is true with this student-mentor environment that the more the students communicate with their mentor, the more motivated they are and the more academic help they receive from their mentor, therefore they progress faster and are more satisfied with the program (Shrader and Jiang, 2001).

Age seems to have a negative relation with academic progress, that is, the older the students, the slower the academic progress. Although this variable is found to be a comparatively very weak predictor, we need to explore the variable further to see if there is indeed a need for different levels of academic support for different age groups.

Courses and hours for studies are significantly correlated with academic progress; however, they seem not powerful enough to predict the variance of the academic progress. Pre-assessment does not have any significant correlation with academic progress.

The limitation of the study is the low survey response rate that results in a small sample size. Survey responses might entail biased responses. In addition, this is a very preliminary study of the complex new environment with basically no prior research to fall back on, and therefore our purpose of this study was very exploratory and caution should be taken in interpreting the findings in this study. Further studies should be more of a qualitative nature. For example, we would like to examine the actual online courses our students are taking, and the patterns of student-mentor interaction, etc. An interesting area that is worth further inquiry is certainly the possible influence of student-mentor interaction, perceived or actual, might have on students' satisfaction and academic progress.

References

Demetrion, G. (1999). The postindustrial future and the origins of competency-based adult education in Connecticut: a critical perspective. (Education Abstract: BEDI99033892).

Dick, W. & Carey, L. (1996). *The systematic design of instruction*. (4th ed.). New York: HarperCollins.

Dille, B. & Mezak, M. (1991). Identifying predictors of high risk community college telecourse students. *The American Journal of Distance Education*, 5(1), 24-35.

Duffy, T.M., & Jonassen, D.H. (1991). Constructivism: New implications for instructional technology? *Educational Technology*, 31(5), 7-12.

Jiang, M. (1998). Distance learning in a Web-based environment: An analysis of factors influencing students' perceptions of online learning, unpublished doctoral dissertation, State of New York University at Albany.

Jiang, M. & Meskill, C. (2000). Analyzing multiple dimensions of Web-based courses: The development and piloting of a coding system. *Journal of Educational Computing Research*. 23(4), 467-486.

Jiang, M., & Ting, E. (2000). A study of factors influencing students' perceived learning in a Web-based environment. *International Journal of Educational Telecommunications*. Vol. 6, No. 4,

Moore, M.G., Thompson, M.M., Quigley, A.B., Clark, G.C., & Goff, G.G. (1990). The effects of distance learning: A summary of the literature. Research Monograph No. 2. University Park, PA: The Pennsylvania State University, American Center for the Study of Distance Education. (ED 330 321)

Kaye, A. R. (Ed.) (1992a). *Collaborative learning through computer conferencing*. New York, NY: Springer-Verlag.

Harasim, L. M. (Ed.) (1990). *On-line education: Perspectives on a new environment*. New York, NY: Praeger Publishing.

Picciano, A. (2001). *Distance Learning: Making Connections Across Virtual Space and Time Teaching and Learning at Distance*. Columbus: Merrill Prentice Hall.

Shrader, V. & Jiang, M. (2001). Mentoring at a distance: Help adult learners succeed in an online learning environment. A short paper accepted for presentation at ED-MEDIA: World Conference on Educational Multimedia and Hypermedia, AACE, 2001, June, 2001, Tempere, Finland. Included as a short paper in Proceedings of ED-Media 2001: World Conference on Educational Multimedia and Hypermedia, AACE, 2001

Spady, W. G. (1977). Competency-based education: A bandwagon in search of a definition. *Educational Researcher*, V0l. 6, no. 1. 1977. Pp. 9-14.

Verduin, J.R. & Clark, T.A. (1991). *Distance education: The foundations of effective practice*. San Francisco, CA: Jossey-Bass Publishers.

Westera, W. & Sloep, P. (1998). The Virtual company: Toward a self-directed, competency-based learning environment in distance education. *Educational Technology*, January-February, 1998.

Western Interstate Commission for Higher Education, Boulder, CO. (1999). (ERIC Dcoument: ED434596)Wighton, David J. (1993). Telementoring: An Examination of the Potential for an Educational Network. Research Coordinator Education Technology Centre of B. C. May, 1993. (http://mentor.creighton.edu/htm/telement.htm)

Willis, B. (1993). *Distance education: A practical guide*. Englewood Cliffs, NJ: Educational Technology Publications. (see Guide #1 Distance Education: An Overview, p 1. http://www/uidaho.edu/evo/dist1.html)

Appendix 1: Survey questions on satisfaction with program and demographic information

1. Scope of knowledge and skills provided by a competency-based model
   Importance ( ) Satisfaction ( )

2. Learning in an online environment
   Importance ( ) Satisfaction ( )

3. Recognition of prior learning by a competency-based model
   Importance ( ) Satisfaction ( )

4. Flexibility of time provided by an on-line degree program
   Importance ( ) Satisfaction ( )

5. Flexibility of place provided by an on-line degree program
   Importance ( ) Satisfaction ( )

6. Online courses delivered by our Educational Providers
   Importance ( ) Satisfaction ( )

7. Possibility of taking courses from different universities to master competencies
   Importance ( ) Satisfaction ( )

8. Option of using independent learning opportunities and resources to master competencies
   Importance ( ) Satisfaction ( )

9. Student services provided by WGU (i.e., financial aid, assessment delivery, customer care center, library services, iChat)
   Importance ( ) Satisfaction ( )

10. Academic services provided by your mentor
   Importance ( ) Satisfaction ( )

11. Demonstrating your competencies through domain assessments
   Importance ( ) Satisfaction ( )

12. Demonstrating your competencies through portfolio items
   Importance ( ) Satisfaction ( )

13. Independent learning resources available from WGU (Web resources, library services, reading list, etc.)
   Importance ( ) Satisfaction ( )

....

20. Please indicate your gender:
   ( ) Female ( ) Male

21. What is your current position? ( )

22. How many years have you worked as an educator? ( )

23. How many months have you been a student at WGU? ( )

24. How many hours per week do you believe you spend working towards your WGU degree? ( )

25. How often do you believe you have contact with your WGU mentor? (please check the appropriate response)

___ more than a month between contacts with my mentor
___ about once a month
___ about twice a month
___ three to four times a month
___ about once a week
___ about twice a week
___ daily
____ other (please specify) _____

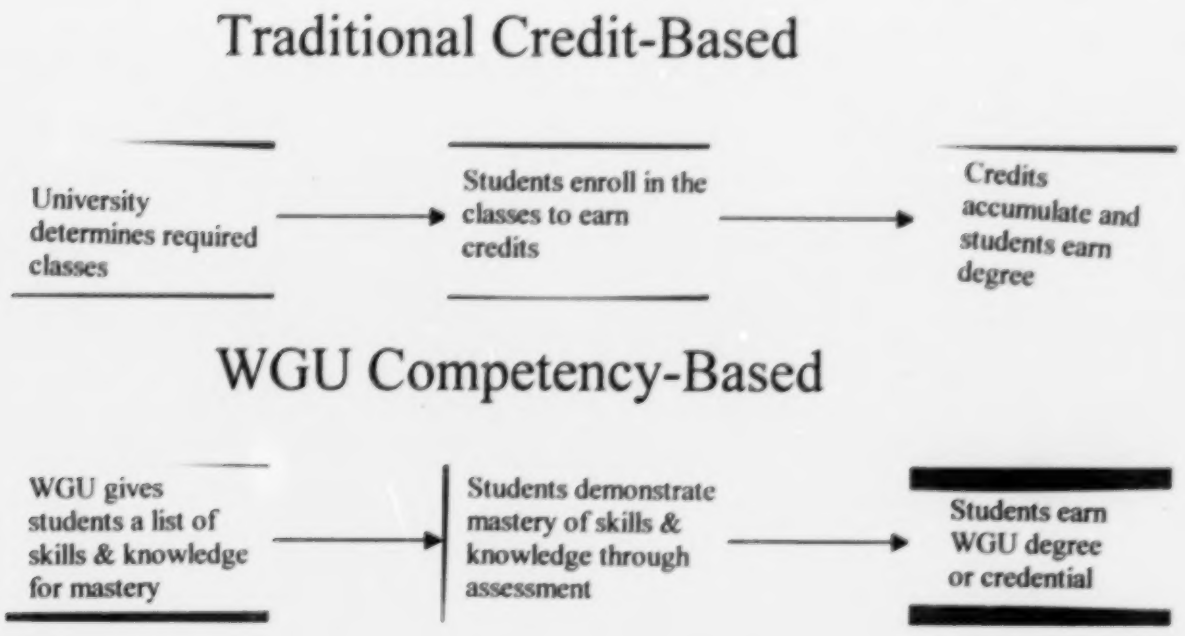
Appendix 2: Summary of survey results (N = 33)

	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Satisfaction Mean
1	4	4	4	4	4	4	4	4	4	4	4	4	3	3.9
2	3	2	2	4	2	2	2	3	2	2	2	2	2	2.3
3	3	3	4	4	4	3	3	3	4	3	3	2	2	3.2
4	2	4	1	3	.	3	3	3	3	3	1	4	2	2.7
5	4	4	4	4	4	4	4	4	4	4	3	4	4	3.9
6	2	2	2	2	2	2	2	2	2	2	2	2	2	2.0
7	3	3	3	4	4	3	4	3	4	4	3	3	4	3.5
8	3	4	4	4	4	2	3	4	4	4	3	4	3	3.5
9	3	2	3	3	4	3	4	3	3	3	2	3	3	3.0
10	3	3	3	4	4	3	4	3	4	3	2	3	3	3.2
11	3	3	3	3	3	3	3	3	3	3	3	3	3	3.0
12	3	1	2	3	.	2	2	3	3	2	1	4	3	2.4
13	4	4	.	4	4	4	4	4	4	4	4	4	4	4.0
14	3	3	2	4	4	4	2	3	2	4	2	2	3	2.9
15	2	3	2	4	4	3	4	2	2	3	2	2	2	2.7
16	2	3	4	4	3	3	4	4	2	4	2	4	2	3.0
17	4	3	4	4	4	3	4	4	3	4	3	4	4	3.7
18	3	3	3	4	2	3	3	2	3	4	2	3	2	2.8
19	2	2	3	4	4	3	3	2	4	4	2	2	4	3.0
20	3	3	3	4	4	4	4	4	4	3	1	4	4	3.5
21	3	4	4	4	4	4	4	4	4	4	3	3	3	3.7
22	3	4	4	4	4	4	3	4	3	4	3	4	4	3.7
23	3	2	3	3	3	3	3	3	3	4	2	3	3	2.9
24	2	3	2	3	3	4	4	3	2	3	3	4	4	3.1
25	3	4	4	4	4	3	3	4	3	3	3	4	4	3.5
26	3	4	4	4	4	3	4	3	3	4	4	3	4	3.6
27	3	4	4	4	4	1	4	3	3	3	2	4	2	3.2
28	3	4	3	4	3	4	3	4	3	4	3	3	3	3.4
29	3	4	2	3	3	3	3	3	3	4	3	2	3	3.0
30	2	2	1	4	4	2	2	.	2	2	1	2	3	2.3
31	4	4	4	4	4	3	3	4	4	4	4	3	4	3.8
32	4	4	2	4	4	3	4	4	4	4	4	4	4	3.8
33	3	2	2	4	4	2	2	4	3	4	1	4	2	2.8
Mean	2.97	3.15	2.97	3.73	3.61	3.03	3.27	3.31	3.15	3.45	2.52	3.21	3.09	3.18
SD	.64	.87	.97	.52	.67	.77	.76	.69	.76	.71	.94	.84	.80	.52

Appendix 3. Data for correlation and multiple regression analyses (N = 32)

	Satis-faction	Academic Progress	Age	Courses	Contacts	Gender	Hours	Interact	Position	Pre-Test	Years in Ed
1	3.9	1.06	33	7	7	1	20	6.24	1	43	3
2	2.3	.08	47	0	1	2	1	.42	1	43	12
3	3.2	.69	27	2	1	1	20	1.77	1	51	6
4	2.7	.17	26	3	1	1	12	1.00	2	34	2
5	3.9	.47	53	3	4	1	5	8.00	1	34	14
6	2.0	.00	43	0	3	2	10	.80	2	33	24
7	3.5	.44	34	3	3	2	7	3.13	1	51	6
8	3.5	.22	42	2	2	1	7	1.11	2	49	16
9	3.0	.43	43	4	2	1	15	1.86	2	51	21
10	3.2	.44	45	5	4	1	15	2.56	1	47	16
11	3.0	.33	38	3	5	2	3	2.00	1	51	3
12	2.4	.67	45	2	3	2	20	6.44	1	50	23
13	4.0	.20	30	3	4	2	5	1.07	2	47	6
14	2.9	.25	42	1	4	2	9	3.25	1	51	.
15	3.0	.00	51	2	5	1	15	2.00	1	49	30
16	3.7	1.38	43	3	4	1	30	11.38	2	39	17
17	2.8	.56	36	8	4	1	7	6.44	2	40	4
18	3.0	.13	49	2	2	2	8	3.50	1	51	23
19	3.5	.41	39	5	2	1	10	3.35	2	45	12
20	3.7	.04	46	4	2	2	5	1.80	1	57	2
21	3.7	.00	43	1	3	1	15	2.17	2	47	21
22	2.9	.43	40	2	2	1	12	3.29	2	42	15
23	3.1	.25	56	3	2	2	20	2.63	2	35	27
24	3.5	.50	35	11	3	1	12	5.63	1	46	13
25	3.6	.33	47	3	5	1	6	5.33	2	46	11
26	3.2	.00	29	0	3	2	20	.20	2	46	5
27	3.4	.17	25	4	2	2	16	1.58	2	42	3
28	3.0	.15	38	4	1	1	3	1.85	2	54	3
29	2.3	.00	43	2	1	1	30	2.36	2	39	21
30	3.8	.44	41	6	5	1	22	4.22	2	51	18
31	3.8	.00	48	1	4	1	3	1.33	1	49	0
32	2.8	.72	31	16	5	2	12	3.33	1	41	8

Figure 1. Model comparison


Traditional Credit-Based
University determines required classes
Students enroll in the classes to earn credits
Credits accumulate and students earn degree
WGU Competency-Based
WGU gives students a list of skills & knowledge for mastery
Students demonstrate mastery of skills & knowledge through assessment
Students earn WGU degree or credential

BEST COPY AVAILABLE

Figure 2. WGU Master of Arts in Learning and Technology

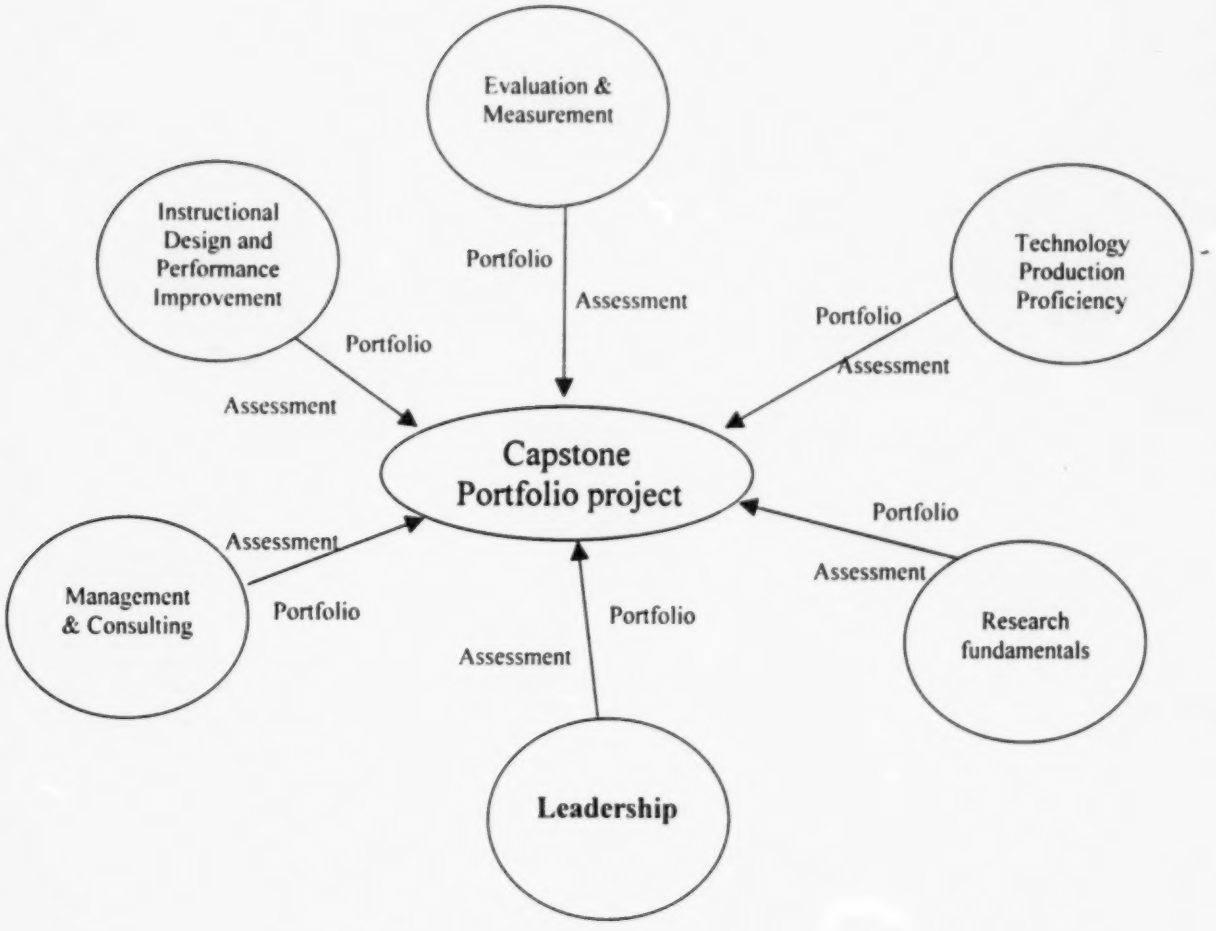


Table 2. Variables for the correlation and Multiple Regression Analyses

Variable Sources	**Demographic variables**				**Student behaviors**				**Academic variables**		
Student Survey		Gender	Current Position	Years in Education	Hours Per week	Student Satisfaction	Contacts with mentor				
Students records	Age								Academic progress	Courses	Pre-test
Outlook Email								Student-Mentor Interaction			

Table 3. Interrelations among students' satisfaction, academic progress, and other variables (N = 32)

	1	2	3	4	5	6	7	8	9	10
1. Satisfaction										
2. Age	-.05									
3. Gender	-.28	-.07								
4. Current position	.02	-.16	-.24							
5. Years in Education	-.31	.63**	-.06	.12						
6. Hours for studies	-.06	-.10	-.21	.25	.40*					
7. Contacts with mentor	.40*	.06	-.05	-.28	-.06	.02				
8. Academic progress	.24	-.19	-.24	-.14	-.08	.40*	.39*			
9. Pretest scores	.27	.01	.08	-.33	-.17	-.24	.02	-.12		
10. Interaction	.28	.20	-.30	-.09	-.13	.31	.43*	.78**	-23	
11. Courses	.14	-.31	-.11	-.16	-.22	.04	.35	.50**	-.07	.32

Note: * $p < .05$, ** $p < .01$.

BEST COPY AVAILABLE